The Use of Micronutrient Supplements Is Not Associated with Better Quality of Life and Disease Activity in Canadian Patients with Systemic Lupus Erythematosus

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ABSTRACT. ***Objective.*** Associations between the use of micronutrient supplements (MS) and disease activity, quality of life (QOL), and healthcare resource utilization were studied in a Canadian population of patients with systemic lupus erythematosus (SLE).

Methods. QOL was assessed by the Medical Outcomes Study 36-item Short Form. Healthcare resource utilization and disease activity/damage were determined.

Results. Of the 259 subjects studied, 53% were MS users and 34% used only calcium/vitamin D. MS users had a higher Systemic Lupus International Collaborating Clinics score and utilized more healthcare resources. Disease activity and QOL were similar between MS users and nonusers.

Conclusion. MS are frequently used by patients with SLE and are not associated with concomitant benefit on QOL. MS users utilized more healthcare resources. (J Rheumatol First Release Dec 1 2009; doi:10.3899/jrheum.090761)

Key Indexing Terms:
MICRONUTRIENTS SUPPLEMENTS
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Health Canada[1] reported that 7 in 10 Canadians have used a complementary/alternative medicine (CAM), and micronutrient supplements (MS) were the most commonly used, by 57%. In rheumatic diseases including systemic lupus erythematosus (SLE), the use of CAM is higher, ranging from 40%–94%[2-4]. Vitamin D/calcium supplements are commonly used, as they are often prescribed by physicians to patients taking steroids. Despite the frequent use of CAM, most patients did not inform their physician, and physicians do not often ask about the use of supplements[5,6]. This could be of concern since in some cases, using supplements may present a health risk. The purpose of this study was to determine the prevalence of MS use among Canadian patients with SLE and the relationship of MS use to quality of life (QOL), disease activity, and healthcare resource utilization.

MATERIALS AND METHODS

The current use of MS was reported by 259 patients (meeting at least 4 of the American College of Rheumatology diagnostic criteria for SLE) from 4 centers across Canada from 2003 to 2009. MS users were those taking any vitamin/mineral in the month prior to the study enrollment.

Disease activity was assessed by the Systemic Lupus Activity Measure (SLAM-R) and SLE Disease Activity Index 2000 (SLEDAI 2K). Scores of SLAM-R > 7 and SLEDAI 2K > 6 were indicative of an active disease[7]. Disease damage in 12 organ systems accrued since the diagnosis of SLE was evaluated using the Systemic Lupus International Collaborating Clinics (SLICC)[7] index.

Health status was assessed based on patient self-reports on a scale of 1–5 (1 = excellent; 5 = poor). QOL was assessed using the Medical Outcomes Study 36-item Short Form (SF-36)[8]. This instrument allows for calculation of normalized scores for physical (physical component summary; PCS) and mental function (mental component summary; MCS). Scores < 48 are considered impaired.

Utilization of healthcare professionals, diagnostic tests, hospitalizations, and use of alternative treatments over the preceding month were evaluated using a portion of a validated questionnaire[9].

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RESULTS

Mean diagnosis age of patients with SLE was 29.3 years. Active disease existed in 23%–28%, 35% were between the ages of 18 and 34 years, 93.4% were women, 76.4% had completed high school, 54% were employed, 38% were smokers, 48% were White-non-Hispanic, and 66% perceived their health status as good/excellent (Table 1).

Table 1. Characteristics of the study participants.

Characteristics	% (n = 259)
Gender	
Female	93 (n = 242)
Male	7 (n = 17)
Age, yrs	
18–34	35 (n = 89)
35–44	23 (n = 58)
45–54	19 (n = 50)
55–64	15 (n = 40)
> 65	9 (n = 22)
Ethnicity	
Hispanic	1 (n = 3)
White (non-Hispanic)	48 (n = 123)
Asian	15 (n = 38)
Aboriginal	2 (n = 4)
Others	15 (n = 40)
No answer	20 (n = 51)
Education	
Some/completed elementary	17 (n = 44)
Completed high school or more	76 (n = 198)
Missing	7 (n = 17)
Currently employed	54 (n = 140)
BMI, kg/m^2	26.2 ± 0.45
Normal (18–26)	63
Underweight (< 18)	3
Overweight (27–29)	12
Obese (> 30)	22
Alcoholic beverages (number/wk)	
< 1	51 (n = 132)
1-6	26 (n = 67)
≥ 7	2 (n = 4)
Missing	22 (n = 56)
SLE duration, yrs	13.0 ± 0.7
ACR criteria	5.8 ± 0.1
SLAM (range 0–86)	4.8 ± 0.2
≥ 7	23 (n = 60)
SLEDAI (range 0–105)	5.3 ± 0.3
> 6	28 (n = 73)
SLICC	1.4 ± 0.1
0	39 (n = 100)
≥ 1	61 (n = 159)
Perceived health status	
Poor	8 (n = 20)
Fair	27 (n = 69)
Good	41 (n = 107)
Very good/excellent	24 (n = 63)

Results are reported as percentage or mean ± SEM. BMI: body mass index; SLE: systemic lupus erythematosus; ACR: American College of Rheumatology; SLAM: Systemic Lupus Activity Measure; SLEDAI: SLE Disease Activity Index; SLICC: Systemic Lupus International Collaborating Clinics.

MS was used by 53%, and 34% used only vitamin D/calcium supplements. The median (interquartile range) daily dose for calcium and vitamin D was 112.5 mg (35–800 mg) and 200 IU (35–800 IU), respectively. Multivitamins (16%), folic acid (1%), vitamins B6 (7%), B complex (8%), B12 (2%), C (1%), and E (3%); and minerals iron (9.2%), magnesium (1%), and potassium (1%) were among the other supplements used. Education level, gender, disease duration, and ethnicity had no influence on the use of supplements.

Disease activity was similar between the 2 groups (MS users vs nonusers; Table 2). After excluding subjects taking only calcium/vitamin D, MS users had a significantly lower SLAM score. However, the SLICC score was higher in MS users compared to nonusers.

Perceived health status was more impaired in MS users regardless of the inclusion/exclusion of those taking only vitamin D/calcium (Table 2). MCS and PCS were similar but impaired in both groups. MS users were more likely to visit healthcare professionals and use diagnostic tests (Table 3).

DISCUSSION

MS was used by 53% of patients with SLE, which is in line with rates of utilization reported for the general Canadian population[1] and consistent with previous studies in rheumatic diseases including SLE that have reported a prevalence ranging from 16% to 94%[2-4,10,11]. However, Moore, *et al*[4] reported a 50% prevalence of CAM use among 707 North Americans/Europeans, but a much lower prevalence (5%–6%) of megavitamin supplements use. This discrepancy could be because they did not include subjects taking mineral supplements and/or calcium/vitamin D. Vitamin D/calcium was the most commonly used supplement in this study. This likely reflects the standard of care for those who are receiving steroids and may not be considered CAM. However, calcium/vitamin D supplements are also commonly used by the general population and so it is difficult to know whether they were used as CAM or were prescribed by a physician in this study. Thus, we conducted the analyses with and without inclusion of those taking calcium/vitamin D.

Practice of complementary treatments is the highest among people with chronic diseases such as those with rheumatic diseases, in which Western allopathic medical approaches still result in incurability, persisting pain, and metabolic complications[12-14]. These patients seek alternative treatments to alleviate symptoms and improve their QOL. However, in this study and consistent with other studies[4,10], QOL was not different between MS users and nonusers. SLAM, a disease activity measure based on patient perception, was lower in MS users after excluding those taking calcium/vitamin D. Yet MS users tended to have higher cumulative damage levels. Because of the cross-sectional design of this study, it is difficult to know whether unsatisfactory outcomes from conventional therapies caused the patients to use MS or whether the supple-

Table 2. Disease activity and health status of users and nonusers of micronutrient supplements.

Measure	Users, n = 137	Nonusers, n = 122	p
SLAM-R	4.6 ± 0.3	5.0 ± 0.3	0.25
SLEDAI-2K	5.2 ± 0.5	5.4 ± 0.5	0.75
SLICC	1.6 ± 0.2	1.2 ± 0.1	0.02
Disease duration, yrs	13.5 ± 1.1	12.4 ± 1.0	0.43
General health (1 = excellent—5 = poor)	3.3 ± 0.08	3.0 ± 0.09	0.007
PCS (≤ 48 = impaired)	38.1 ± 1.1	40.0 ± 1.1	0.21
MCS (≤ 48 = impaired)	46.9 ± 1.0	47.3 ± 1.0	0.76
Excluding those taking calcium/vitamin D	n = 48	n = 122	
SLAM-R	4.0 ± 0.4	5.0 ± 0.3	0.042
SLEDAI-2K	5.0 ± 0.7	5.4 ± 0.5	0.67
SLICC	1.6 ± 0.3	1.2 ± 0.1	0.092
Disease duration, yrs	11.2 ± 1.4	12.4 ± 1.0	0.48
General health (1 = excellent—5 = poor)	3.3 ± 0.1	3.0 ± 0.09	0.057
PCS (≤ 48 = impaired)	38.8 ± 1.9	40.0 ± 1.1	0.57
MCS (≤ 48 = Impaired)	46.2 ± 1.7	47.3 ± 1.0	0.56

Results are reported as mean ± SEM. $p < 0.05$ considered statistically significant. SLAM: System Lupus Activity Measure; SLEDAI: SLE Disease Activity Index; SLICC: Systemic Lupus International Collaborating Clinics; MCS: mental component scores; PCS: physical component scores.

Table 3. Healthcare resource utilization among users and nonusers of micronutrient supplements.

Resource use	Users, n = 137	Nonusers, n = 122	p
Visits to healthcare professionals (% of respondents)	86.0	75.2	0.027
Excluding those taking calcium/vitamin D	95.8	75.2	0.002
Number of visits to healthcare professionals	2.35 ± 0.22	2.28 ± 0.25	0.831
Excluding those taking calcium/vitamin D	2.75 ± 0.40	2.28 ± 0.25	0.324
Use of diagnostic tests (% of respondents)	77.8	63.3	0.011
Excluding those taking calcium/vitamin D	85.1	63.3	0.006
Number of diagnostic tests	2.18 ± 0.21	1.85 ± 0.23	0.298
Excluding those taking calcium/vitamin D	2.58 = 0.36	1.85 ± 0.23	0.091
Hospital emergency visits (% of respondents)	5.9	8.3	0.45
Excluding those taking calcium/vitamin D	6.2	8.3	0.66

Results are reported as mean ± SEM or percentage. Chi-square test and unpaired t-test was used for group comparison. P , 0.05 considered statistically significant.

ment itself, or the possibility that the supplements were of low quality, interfered with the therapeutic effect and/or increased the toxicity of conventional treatments.

Of concern is that 70% of patients do not consult a physician before initiating the CAM therapy[5,6]. Under the current law, vitamins, supplements, and herbs do not have to be evaluated by any regulatory agency prior to their sale. This leaves the consumer with little or no meaningful information about potential benefits, side effects, or adverse drug interactions.

In our study, health services were utilized more by MS users, consistent with the findings of Moore, *et al*[4], reporting 24% higher direct medical costs for CAM users than nonusers. Although cause and effect cannot be determined in this study, there appears to be no differences in objective measures between users and nonusers that would explain the higher use of conventional medical resources. This may be a manifestation of general care-seeking behavior, which leads to an increased consumption of both conventional and nonconventional healthcare resources.

These data should be interpreted with caution since we surveyed only patients who chose to receive care in a conventional setting and were more likely to complete the survey. Our results could underestimate the use of MS, since those who chose CAM as their only method or option for SLE treatment were not included.

Micronutrient supplements are used commonly by patients with SLE. Unfortunately, our cross-sectional data do not allow us to discern a pattern differentiating users and nonusers in terms of disease activity and/or QOL. Since nutritional supplements are not regulated, both patients and physicians will benefit from education strategies regarding the use of CAM.

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